

Evaluation of PAC and PVC frequencies in Holter monitoring and their association with biventricular pacing percentage in CRT candidates: A prospective study in Booali Sina Hospital

Abstract

BACKGROUND: Several studies evaluate the acute and long term effects of CRT on clinical status in heart failure patients. The results of these trials were equally encouraging, with patients demonstrating consistent, sustained improvement in exercise tolerance, quality of life, and New York Heart Association (NYHA) functional class and reduced left ventricle reverse remodeling. Based on the advantages discussed above, a high percentage of biventricular pacing is required for optimal outcome in patients treated with cardiac resynchronization therapy (CRT), but the influence of ectopic beats on the success of biventricular pacing has not been well established.

OBJECTIVES: Previous studies have proved that a high percentage of biventricular pacing is essential to achieve the favorable CRT outcome. This implies the necessity to determine the factors that can contribute to a reduced biventricular pacing. This study sought to determine whether increased ectopic beats reduce the chance of high biventricular pacing percentage and are associated with subsequent adverse outcomes.

MATERIALS and METHODS: Based on database available from Booali Sina Hospital, 50 patients with an implanted CRT-defibrillator device with data available on biventricular pacing percentage and pre-implantation 24-h Holter recordings were included. Using logistic regression, we estimated the influence of ectopic beats on the percentage of biventricular pacing.

RESULTS: In the pre-implantation Holter recording, ectopic beats accounted for a mean $0.6 \pm 0.14\%$ of all beats. The age range of the patients in this study was from 38 to 86 years of age, with a mean of 67. Worth noting that 62% of the patients were male and 38% were female. The probability of subsequent low biventricular pacing percentage ($<95\%$) was increased in patients with $>1.5\%$ ectopic beats compared with those with $\leq 0.1\%$ ectopic beats. (OR: 5.00; 95% CI 1.44-17.27; $p < 0.001$)

CONCLUSION: It has been noticed that a relatively high frequency of ectopic beats ($>1.5\%$) can dramatically increase the probability of low biventricular pacing ($<95\%$) which lowers the efficacy of CRT. This supports pre-implantation Holter monitoring of patients selected for CRT for optimal outcome. This also underlines the possible need of treatment of these ectopic beats for patients that have had CRT.

KEY WORDS: biventricular pacing, cardiac resynchronization therapy, ectopic beats, Holter monitoring